4.3.3.2.2.2 *Site Infrastructure*

Implementation of the alternative for immobilization of Pu with emplacement into a deep borehole requires construction and operation of both a stand-alone borehole complex and a ceramic immobilization facility. The ceramic immobilization facility impacts are previously shown in Section 4.3.3.2.1.2.

Since no actual sites for a deep borehole complex have been considered, the site infrastructure impact analysis for constructing, operating, and post-closure monitoring of the borehole complex compares the borehole requirements shown in the appendices, with the generic borehole site described in Section 3.9.2. Upon completion of the Pu disposition mission, only a concrete cap would remain on the surface of the borehole.

The region's utility and transportation infrastructure must be extended to support the facilities and operations of this proposed borehole complex. Connection of the borehole complex to the nearest existing electrical utility via high-voltage transmission lines may require construction of additional transmission lines and obtaining rights-of-way. The additional 6,100 MWh electrical requirement for the entire borehole complex would not have a noticeable effect on a sub-regional electrical power pool. Since emergency power would be provided by diesel generators located in the facility utility area, there would be no additional impact to the electrical pool during emergencies.

Impacts from construction of the deep borehole facility using standard construction practices for the surface facilities and transportation links are similar to those of the deep borehole complex for Direct Disposition Alternative shown in Section 4.3.3.1.2. As in Section 4.3.3.1.2, the greatest surface effects from subsurface borehole construction/drilling would be caused by the surface retention areas, which would contain all material removed during drilling operations. The total amount of utility and material resources consumed during the construction period, assuming 1.6 km (1 mi) of roads, is shown in Table 4.3.3.2.2.2–1.

Table 4.3.3.2.2.2–1. Additional Site Infrastructure Needed for the Construction of the Deep Borehole Complex—Immobilized Disposition Alternative (Annual)

Resource	Construction Requirement	Range of Resource Availability
Electrical	567 MWh	6,500 to 12,000 MWh
Oil	2,000,000 l	0 to 100 million l
Natural gas	0	0 to 5 million m^3
Coal	0	0 to 200,000 t

Source: LLNL 1996h.

Since the lower end of the range of resources available generally exceeds the annualized construction requirement, there would be minimal impact due to construction of the borehole complex.

Operations at the surface processing facilities require electrical power, compressed air, and water. Emplacing-borehole sealing and drilling facilities require process water, process water waste treatment, and electrical power. The resulting site infrastructure changes required to operate the deep borehole complex for disposal of immobilized forms during normal operations are shown in Table 4.3.3.2.2.2–2. The range of available resources was previously described in Section 3.9.2. The additional 6,100 MWh electrical requirement to operate the entire borehole complex for a year would have no measurable impact on any of the sub-regional power pools in the contiguous 48 states. Fuel and transportation requirements present no measurable impacts. Since oil and natural gas availability is governed by usage, the additional oil and natural gas could be procured.

During the post-closure period, the borehole array area of 25 ha (62 acres) would be declared a limited access area indefinitely, and a 1.6-km (1-mi) buffer zone of 1,358 ha (3,355 acres) may also be declared off-limits. The disturbed area remaining after decommissioning would be the 15x15 m (50x50 ft) concrete security and water anti-infiltration caps installed above the borehole array, assumed to be four holes. Even though the borehole

Table 4.3.3.2.2.2–2. Additional Site Infrastructure Needed for the Operation of the Deep Borehole Complex—Immobilized Disposition Alternative (Annual)

	Transportation		Electrical		Fuel		
	Roads (km)	Railroads (km)	Energy (MWh/yr)	Peak Load (MWe)	Oil (l/yr)	Natural Gas (m^3/yr)	Coal (t/yr)
Facility Requirement	1.6	1.6	6,100	2	773,280	4,810,000	0
Range of resource availability	0 to 60	0 to 20	6,500 to 12,000	2 to 1,000	0 to 100 million	0 to 5 million	0 to 200,000
Amount required in excess to low-end range of available resources	1.6	1.6	0	0	773,280	4,810,000	0

Source: LLNL 1996h.

would be designated as limited access, there are minimal continuing requirements or effects above ground. These minimal requirements include surveillance and groundwater monitoring. Surveillance could be accomplished from a remote location without impact at the site. Groundwater monitoring could be done from locations at various distances from the site. There would be a continuing infrastructure impact directly at the site in that any future land use requiring excavation or mining operations would be restricted in perpetuity. Such restrictions could be institutionalized through construction of drilling barriers and installing a variety of permanent markers.